



HANTAVIRUS PULMONARY SYNDROME

1. **Agent:** At least nine hantaviruses have been identified in North America, each with a distinct rodent host. Four of these may cause hantavirus pulmonary syndrome. The most common is Sin Nombre virus, the agent responsible for the 1993 epidemic in the Southwestern USA. Other hantaviruses cause a distinct syndrome called hemorrhagic fever with renal syndrome (HFRS); the only such agent in North America is Seoul virus.

2. Identification:

- a. **Symptoms:** Fever, myalgia and GI complaints followed by the abrupt onset of respiratory distress and hypotension with rapid progression to severe respiratory failure and cardiogenic shock. The illness can progress rapidly to become clinically compatible with adult respiratory distress syndrome (ARDS).

Elevated hematocrit, thrombocytopenia, and hypoalbumenia are common laboratory findings. The crude mortality rate is approximately 40%-50%. Rare instances of renal or hemorrhagic disease may occur.

- b. **Differential Diagnosis:** Other types of ARDS.
 - c. **Diagnosis:** Serologic tests for specific IgM antibodies using ELISA (enzyme linked immunosorbent assay) or Western blot techniques. PCR analysis of tissue samples or immunohistochemistry can be performed on biopsy specimens or at autopsy.
3. **Incubation period:** Approximately 2 weeks, with a range from 3 days to 6 weeks.
 4. **Reservoir:** The major reservoir of Sin Nombre virus appears to be the deer mouse, *Peromyscus maniculatus*. Antibodies have also been found in other *Peromyscus* species, pack rats, chipmunks and other rodents.
 5. **Source:** Saliva or excreta of infected rodents.
 6. **Transmission:** Aerosol transmission from rodent excreta, bites of infected rodents, direct

contact of broken skin or mucous membranes with rodent excreta.

7. **Communicability:** No evidence of spread from person-to-person.
8. **Specific Treatment:** Supportive measures only.
9. **Immunity:** All persons without prior infection are presumed to be susceptible.

REPORTING PROCEDURES

1. **Reportable:** All cases and suspected cases of Hantavirus pulmonary syndrome require immediate notification by telephone to ACDC, *California Code of Regulations*, Section 2500.

Report forms: Upon notification, ACDC will complete [HANTAVIRUS INFECTIONS CASE REPORT \(CDPH 9077\)](#) and notify the State Division of Communicable Disease Control.

[HANTAVIRUS PULMONARY SYNDROME SCREENING FORM \(acd-hantavirusscreen\)](#)

2. Epidemiologic Data:

- a. Exposure to rodents or rodent excreta in the 6 weeks prior to onset. Rural residence with signs of rodent infestation.
- b. Exposure to rarely opened or seasonally closed buildings, such as vacation cabins or storage facilities.
- c. Occupation, job duties.
- d. Travel in previous 6 weeks.
- e. Case finding: Similar illness among co-workers or household members.

CONTROL OF CASE, CONTACTS & CARRIERS

CASES:

Isolation: None

CONTACTS: No restrictions.

CARRIERS: Not applicable.



PREVENTION-EDUCATION

1. Control rodents.
2. Workers in high-risk occupations should wear protective clothing and respirators.
3. Using a disinfectant solution, wet-clean cabins or buildings which are rarely opened, and which have past or present rodent problems.
4. Dispose of potentially infectious waste (rodent feces or carcasses) in double plastic bags.
5. Give disease-specific pamphlet.

DIAGNOSTIC PROCEDURES

Note: serological confirmatory testing is completed at the Viral and Rickettsial Disease Laboratory, California Department of Public Health, after approval by ACDC.

1. **Serology:** Acute serum; convalescent serum drawn at least 21 days after first specimen.

Container: Red top or red-gray top serum separator tube.

Laboratory Form: Test Requisition and Report Form H-3021

Examination Requested: Hantavirus.

Material: Whole blood.

Amount: Minimum 1 mL (2.5 mL preferred).

Storage: Refrigerate until transported.

2. **Tissue Examination:** Formalin-fixed or paraffin-embedded tissues. Consult with CDC for testing.

Material: Lung, kidney, and spleen tissues are preferred.

3. **Storage:** Consult with CDC.

4. **PCR/Virus Isolation:** Consult with CDC for testing.

Material:

Ante-mortem: Biopsy material of the lung or bone marrow aspirate or clot.

Post-mortem: spleen, lung, kidney, liver, lymph nodes, heart, pancreas, pituitary, brain, or liver tissue, or heart blood.